



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64530

DST#: 1

Test Start: 2016.01.08 @ 11:00:55

GENERAL INFORMATION:

Formation: **Toronto**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:51:55

Time Test Ended: 18:04:55

Test Type: Conventional Bottom Hole (Initial)

Tester: Brandon Turley

Unit No: 79

Interval: 3980.00 ft (KB) To 4020.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4020.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press@RunDepth: 182.61 psig @ 3981.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.08

End Date: 2016.01.08

Last Calib.: 2016.01.08

Start Time: 11:01:00

End Time: 18:04:54

Time On Btm: 2016.01.08 @ 12:50:55

Time Off Btm: 2016.01.08 @ 15:54:25

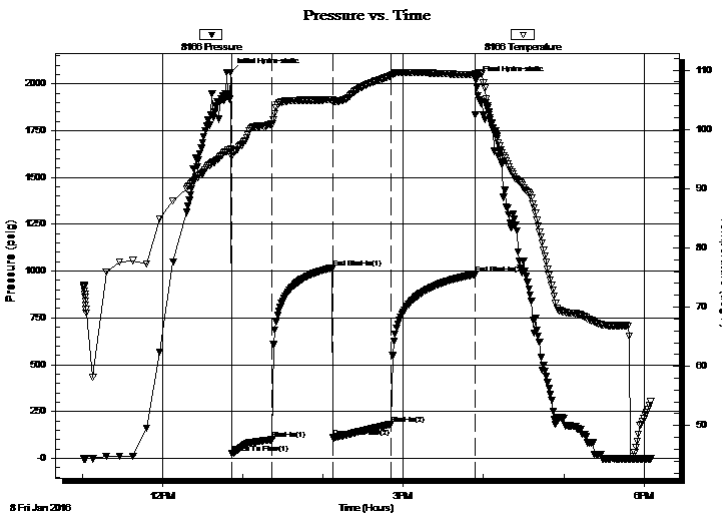
TEST COMMENT: IF: 1/4 blow BOB in 23 min.

IS: No return.

FF: BOB in 29 min.

FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2060.07	96.67	Initial Hydro-static
1	24.72	95.40	Open To Flow (1)
31	101.24	100.88	Shut-In(1)
76	1017.83	104.98	End Shut-In(1)
77	110.66	104.67	Open To Flow (2)
120	182.61	109.10	Shut-In(2)
183	982.87	109.20	End Shut-In(2)
184	2019.02	108.65	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 90%w 10%m	0.67
124.00	ocw m 5%o 35%w 60%m	1.74
93.00	gocm 10%g 30%o 60%m	1.30
41.00	go 30%g 70%o	0.58

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



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Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64530

DST#: 1

ATTN: John Goldsmith

Test Start: 2016.01.08 @ 11:00:55

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

6000 ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.60 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 5400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	mcw 90%w 10%m	0.674
124.00	ocw m 5%o 35%w 60%m	1.739
93.00	gocm 10%g 30%o 60%m	1.305
41.00	go 30%g 70%o	0.575

Total Length: 382.00 ft

Total Volume: 4.293 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

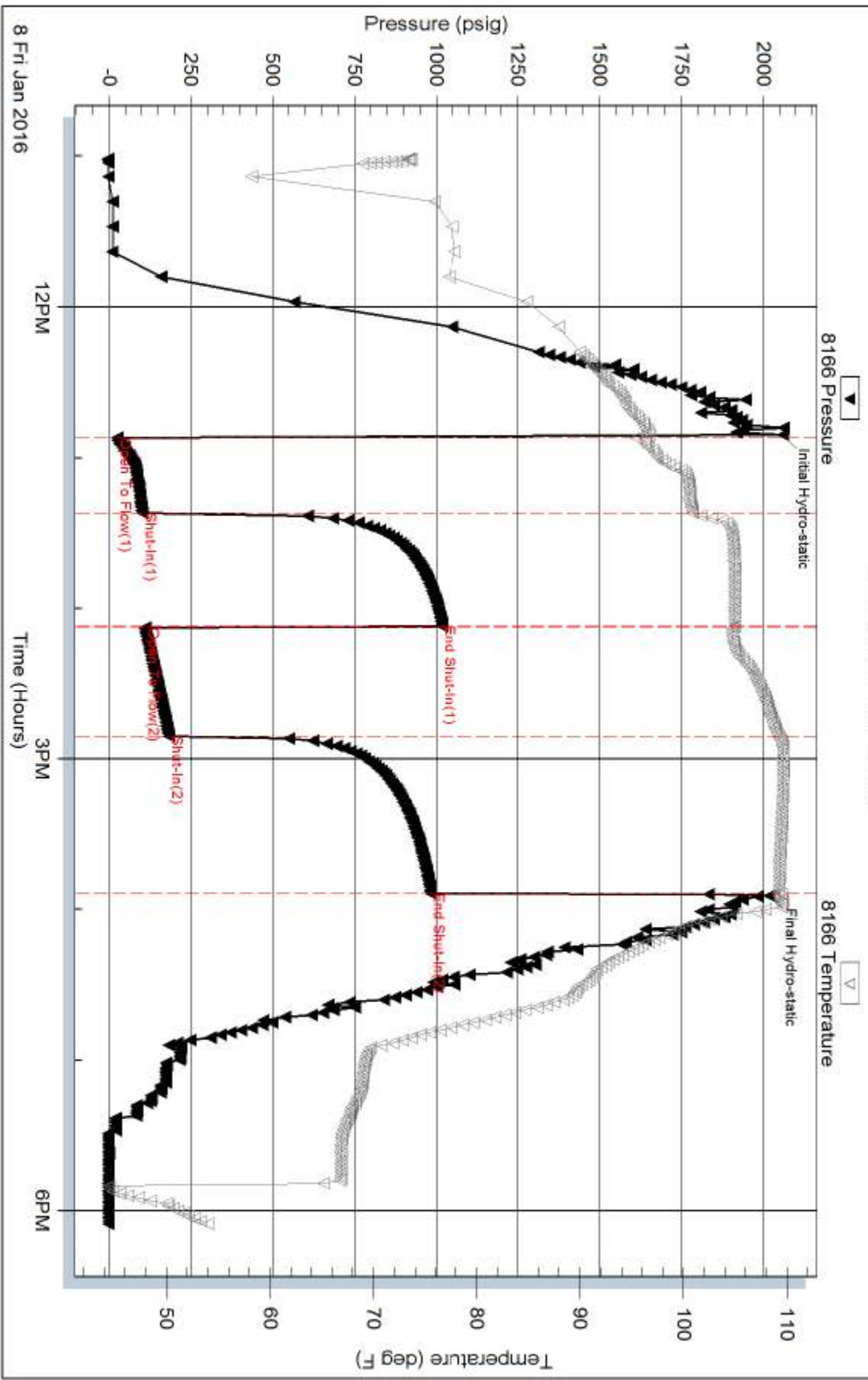
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 1.4@63=6000

Pressure vs. Time



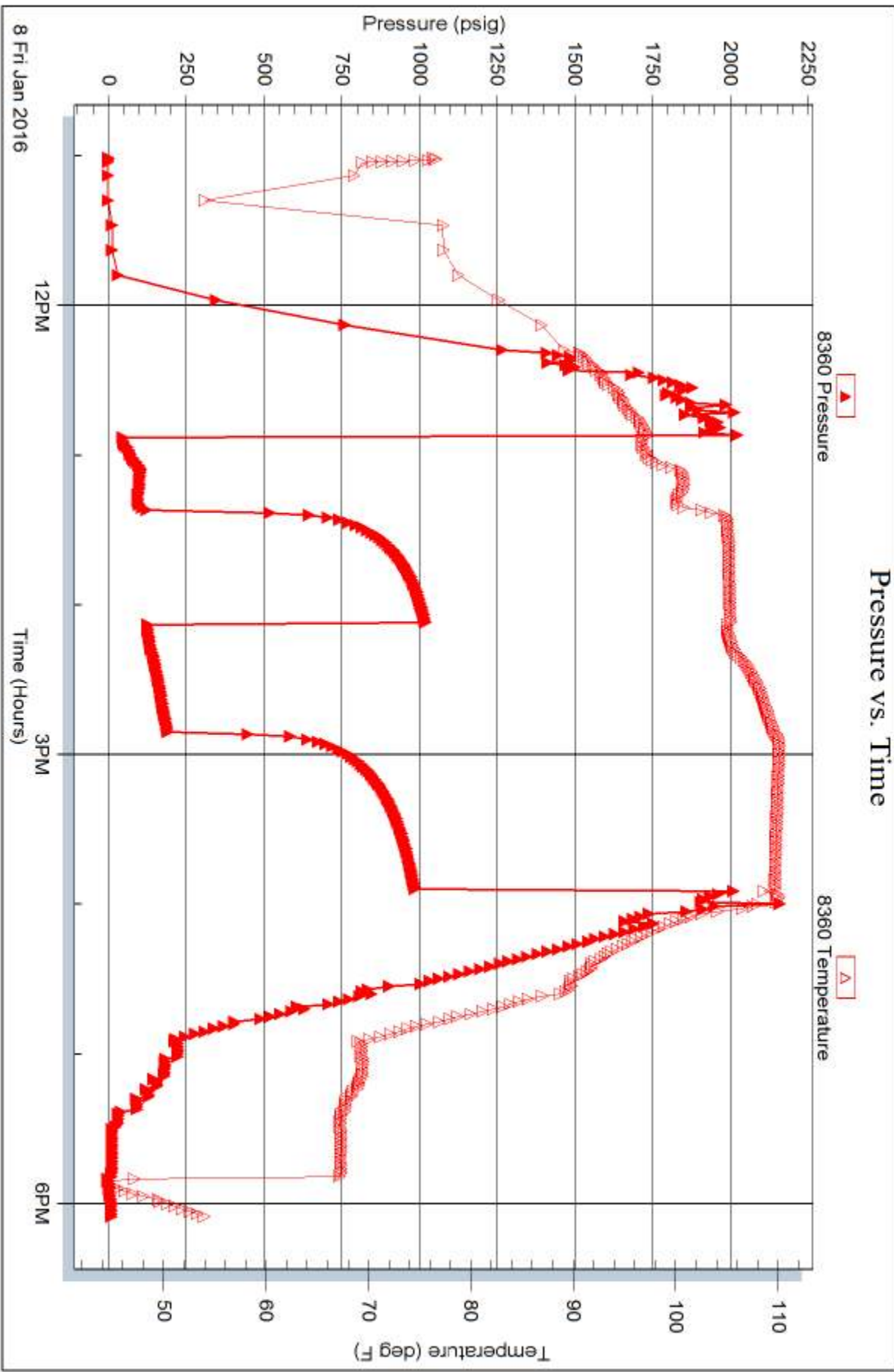
Serial #: 8360

Inside

Ritchie Exploration

Wing Trust 23 A #1

DST Test Number: 1





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DRILL STEM TEST REPORT

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64531

DST#: 2

Test Start: 2016.01.09 @ 22:15:17

GENERAL INFORMATION:

Formation: **HIJ**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 00:35:17
 Time Test Ended: 05:46:47
 Interval: **4200.00 ft (KB) To 4300.00 ft (KB) (TVD)**
 Total Depth: 4300.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brandon Turley
 Unit No: 79
 Reference Elevations: 3292.00 ft (KB)
 3287.00 ft (CF)
 KB to GR/CF: 5.00 ft

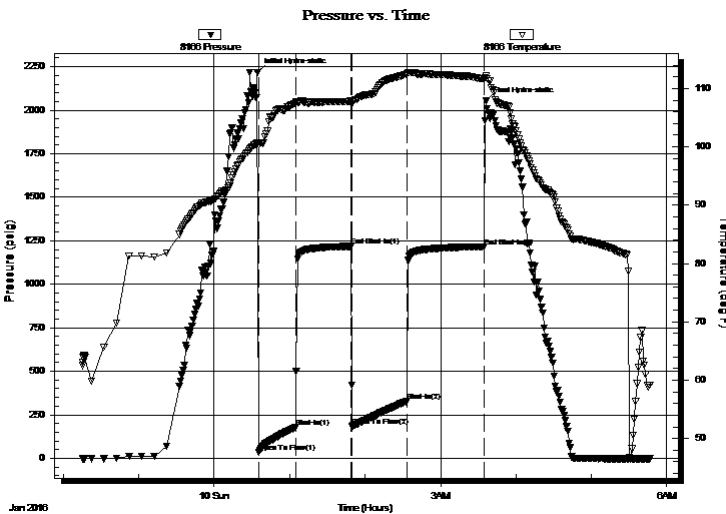
Serial #: 8166

Outside

Press@RunDepth: 326.63 psig @ 4201.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2016.01.09 End Date: 2016.01.10 Last Calib.: 2016.01.10
 Start Time: 22:15:22 End Time: 05:46:46 Time On Btm: 2016.01.10 @ 00:34:17
 Time Off Btm: 2016.01.10 @ 03:36:17

TEST COMMENT: IF: BOB in 10 min.
 IS: No return.
 FF: BOB in 10 min.
 FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2216.91	100.59	Initial Hydro-static
1	34.41	100.26	Open To Flow (1)
31	178.61	107.43	Shut-In(1)
75	1217.92	107.80	End Shut-In(1)
76	186.14	107.62	Open To Flow (2)
119	326.63	112.47	Shut-In(2)
181	1215.84	111.62	End Shut-In(2)
182	2051.88	112.15	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
186.00	mw 50%w 50%m	1.54
248.00	w cm 20%w 80%m	3.48
236.00	mud 100%m	3.31

* Recovery from multiple tests

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



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FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64531

DST#: 2

ATTN: John Goldsmith

Test Start: 2016.01.09 @ 22:15:17

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

25000 ppm

Viscosity: 66.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.79 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
186.00	mw 50%w 50%m	1.543
248.00	w cm 20%w 80%m	3.479
236.00	mud 100%m	3.310

Total Length: 670.00 ft Total Volume: 8.332 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .33@57=25000



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Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64532

DST#: 3

Test Start: 2016.01.10 @ 22:28:34

GENERAL INFORMATION:

Formation: **Altamont**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:29:34

Time Test Ended: 05:53:04

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

Interval: 4400.00 ft (KB) To 4459.00 ft (KB) (TVD)

Reference Elevations: 3292.00 ft (KB)

Total Depth: 4459.00 ft (KB) (TVD)

3287.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press@RunDepth: 414.69 psig @ 4401.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2016.01.10

End Date:

2016.01.11

Last Calib.:

2016.01.11

Start Time: 22:28:39

End Time:

05:53:03

Time On Btm:

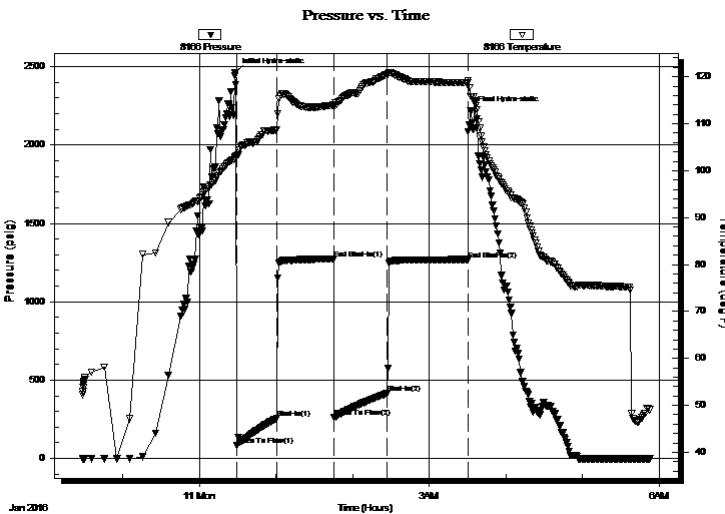
2016.01.11 @ 00:28:04

Time Off Btm:

2016.01.11 @ 03:32:34

TEST COMMENT: IF: BOB in 7 min.
IS: No return.
FF: BOB in 10 min.
FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2464.29	103.00	Initial Hydro-static
2	84.48	103.12	Open To Flow (1)
33	256.84	108.65	Shut-In(1)
77	1272.31	113.93	End Shut-In(1)
78	261.89	113.52	Open To Flow (2)
119	414.69	120.49	Shut-In(2)
182	1270.09	118.77	End Shut-In(2)
185	2218.32	115.80	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	ocmw 10%o 80%w 10%m	0.67
186.00	gocmw 20%g 40%o 30%w 10%m	2.61
310.00	gocw m 10%g 10%o 50%w 30%m	4.35
310.00	ocw m 20%o 10%w 70%m	4.35

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

* Recovery from multiple tests



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FLUID SUMMARY

Ritchie Exploration

23-15s-36w Logan Ks

8100 E 22nd st N 700
Wichita, Ks 67278

Wing Trust 23 A #1

Job Ticket: 64532

DST#: 3

ATTN: John Goldsmith

Test Start: 2016.01.10 @ 22:28:34

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

19000 ppm

Viscosity: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 9.59 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
124.00	ocmw 10%o 80%w 10%m	0.674
186.00	gocmw 20%g 40%o 30%w 10%m	2.609
310.00	gocw m 10%g 10%o 50%w 30%m	4.348
310.00	ocw m 20%o 10%w 70%m	4.348

Total Length: 930.00 ft Total Volume: 11.979 bbl

Num Fluid Samples: 0

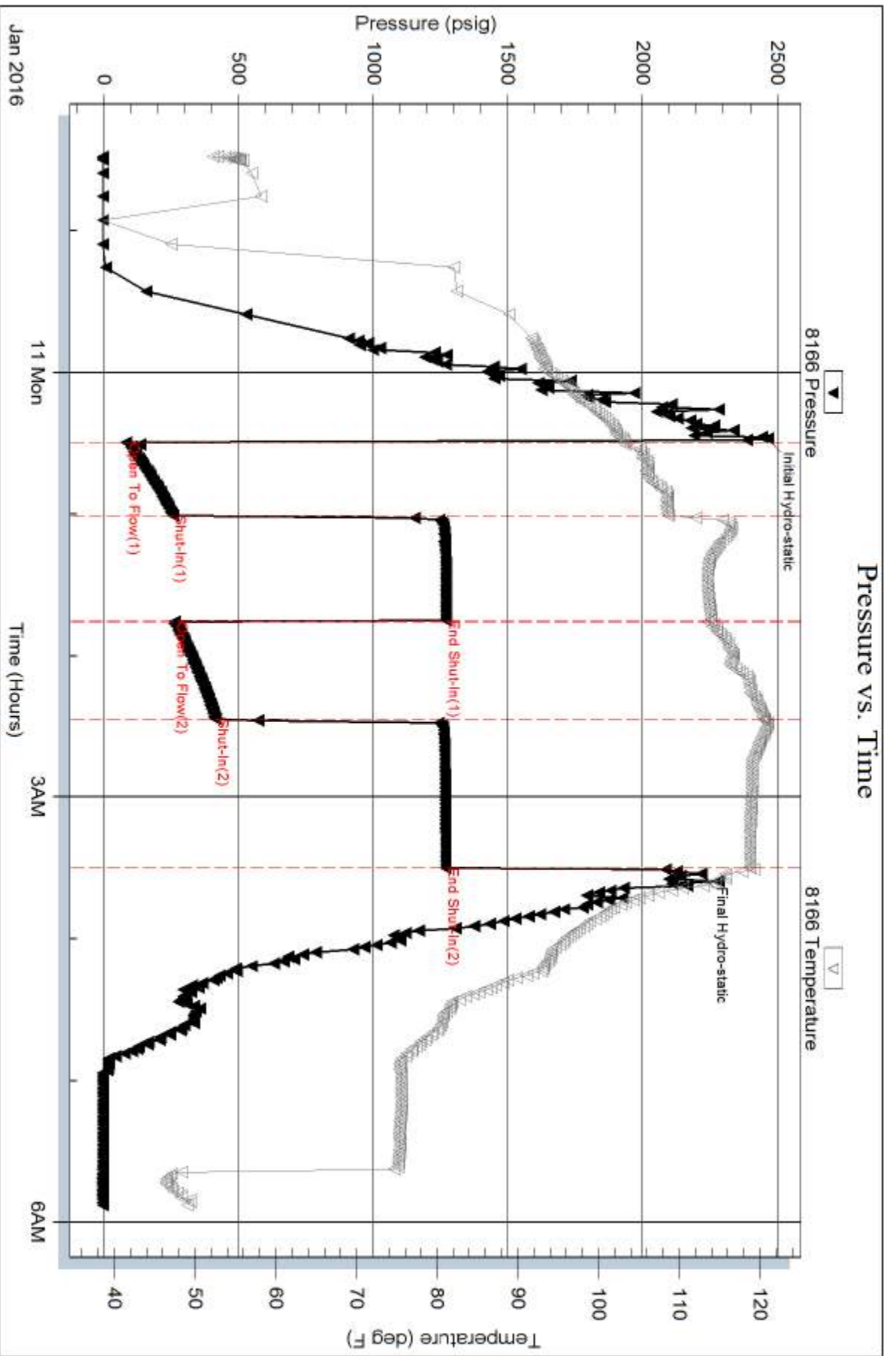
Num Gas Bombs: 0

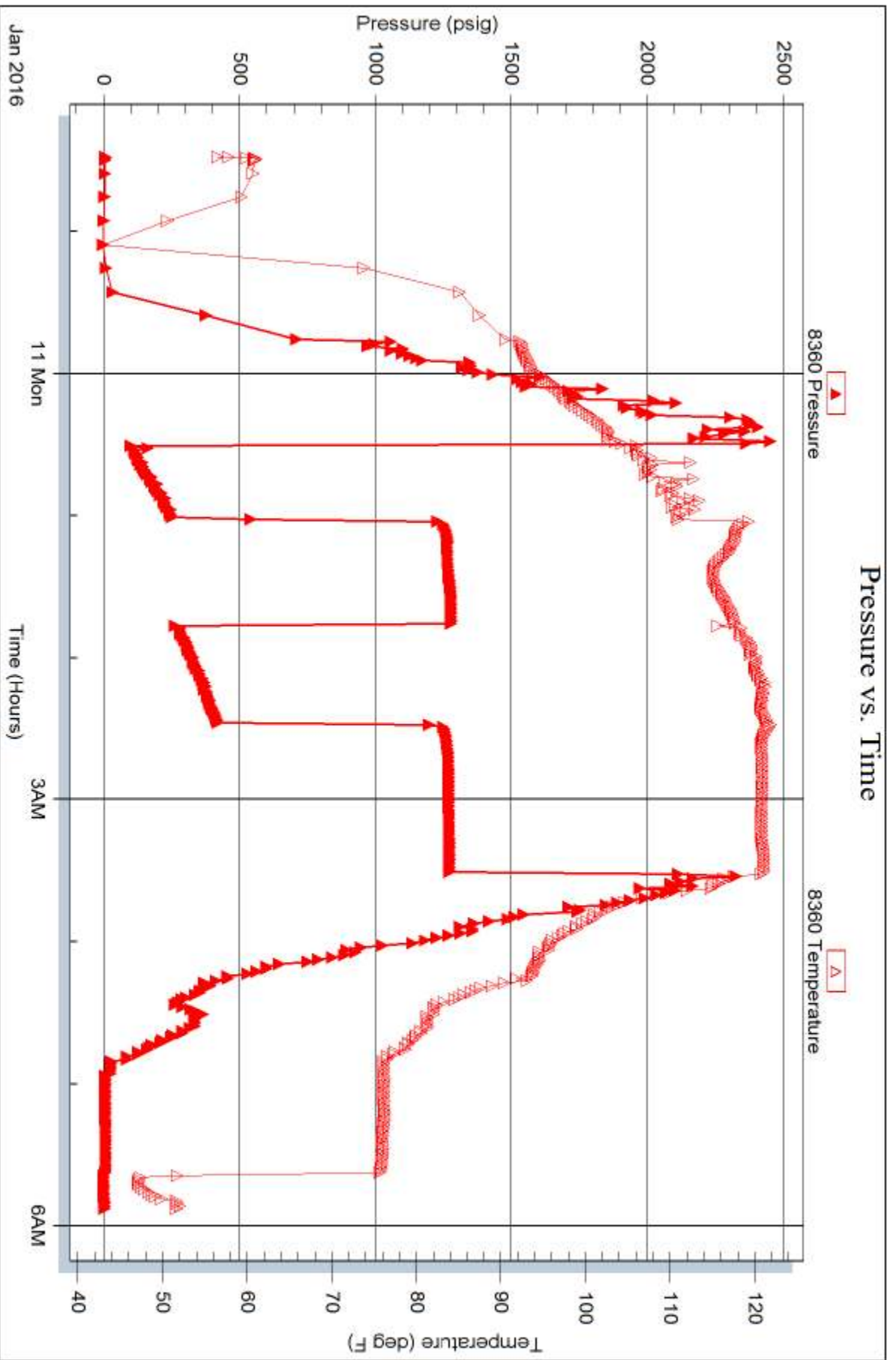
Serial #:

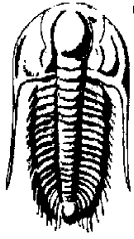
Laboratory Name:

Laboratory Location:

Recovery Comments: .44@56=19000







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23-15s-36w Logan Ks

8100 E 22nd st N 700
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Wing Trust 23 A #1

ATTN: John Goldsmith

Job Ticket: 64533

DST#: 4

Test Start: 2016.01.11 @ 13:11:45

GENERAL INFORMATION:

Formation: **Altamont B**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 15:57:45

Time Test Ended: 19:53:45

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

Interval: 4459.00 ft (KB) To 4482.00 ft (KB) (TVD)

Total Depth: 4482.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3292.00 ft (KB)

3287.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 8166 Outside

Press @ Run Depth: 143.89 psig @ 4460.00 ft (KB)

Start Date: 2016.01.11

End Date:

2016.01.11

Start Time: 13:11:50

End Time:

19:53:44

Capacity: 8000.00 psig

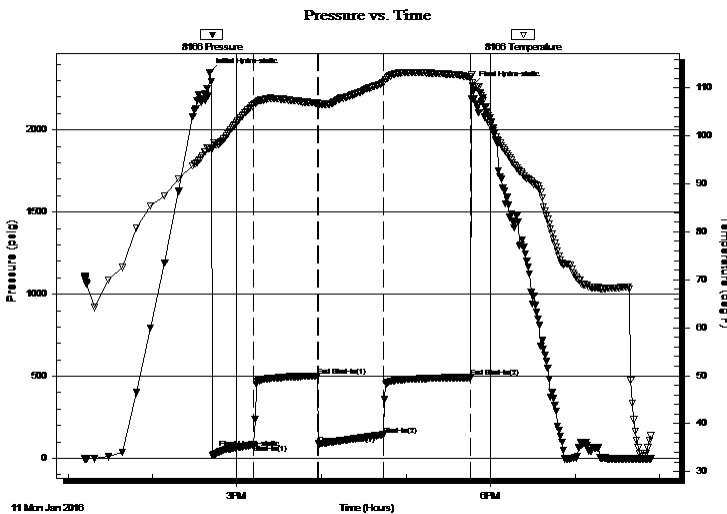
Last Calib.: 2016.01.11

Time On Btm: 2016.01.11 @ 14:40:45

Time Off Btm: 2016.01.11 @ 14:42:45

TEST COMMENT: IF: BOB in 18 min.
IS: Surface blow built to 2 1/4.
FF: BOB in 23 min.
FS: Surface blow built to 1.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2349.18	97.41	Initial Hydro-static
2	20.76	97.36	Final Hydro-static
31	83.49	106.46	Shut-In(1)
77	500.91	106.85	End Shut-In(1)
77	88.84	106.63	Open To Flow (1)
123	143.89	111.02	Shut-In(2)
185	492.43	112.27	End Shut-In(2)
187	2268.87	111.01	Final Hydro-static

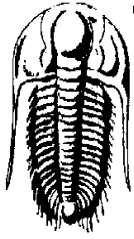
Recovery

Length (ft)	Description	Volume (bbl)
62.00	ocmw 5%o 75%w 20%m	0.30
124.00	ocw m 10%o 10%w 80%m	1.24
155.00	go 50%g 50%o	2.17
0.00	279 GIP	0.00

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

* Recovery from multiple tests



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Wing Trust 23 A #1

Job Ticket: 64533

DST#: 4

ATTN: John Goldsmith

Test Start: 2016.01.11 @ 13:11:45

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

33 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

26500 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.79 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
62.00	ocmw 5%o 75%w 20%m	0.305
124.00	ocw m 10%o 10%w 80%m	1.238
155.00	go 50%g 50%o	2.174
0.00	279 GIP	0.000

Total Length: 341.00 ft Total Volume: 3.717 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 31@40=33

.30@60=26500

